

*Students will understand that there are similarities within the diversity of all living things.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>A1. Given a <b>set of objects</b>, student can <b>sort them into two categories, living and non-living</b>.</p> <p>A2. Student can <b>match a living thing to one of its characteristics</b> (ex., size, home, food, etc.)</p> <p>A3. Student can <b>match a picture/model of a baby organism to the adult</b> of the same organism (ex., colt/horse, human baby/human adult, seed/plant).</p> <p>A4. <b>Given a collection of 5 or fewer objects</b>, student can, based on one attribute, <b>sort the objects into two or more groups</b>.</p>	<p>Portfolio contains evidence that:</p> <p>A1. Given a <b>set of objects</b>, student can <b>sort them into two categories, living and non-living</b>, and <b>give a difference between</b> living and non-living.</p> <p>A2. Student can <b>indicate/identify one characteristic of two different living things</b>.</p> <p>A3. Student can <b>match pictures of at least two different stages of life to the adult stage</b> of the living thing represented.</p> <p>A4. <b>Given two sets of objects</b>, student can <b>identify the "rule" by which</b> the objects <b>have been sorted</b>.</p>	<p>Portfolio contains evidence that:</p> <p>A1. After <b>sorting objects into two categories (living and non-living)</b>, student can <b>give two differences between</b> living and non-living things.</p> <p>A2. Student can <b>describe/demonstrate one characteristic of three different (plant/animal) living things</b>.</p> <p>A3. Student can <b>explain, draw, sequence, or otherwise demonstrate three stages</b> in a life cycle: birth, life, and death for an organism.</p> <p>A4. <b>Given a collection of objects</b>, student can <b>sort the objects into two groups and describe the "rule" by which</b> each group was <b>sorted</b>.</p>	<p>Portfolio contains evidence that:</p> <p>A1. After <b>sorting objects into two categories (living and non-living)</b>, student can <b>give three differences between</b> living and non-living things.</p> <p>A2. Student can <b>describe/demonstrate two characteristics of three different (plant/animal) living things</b>.</p> <p>A3. Student can <b>explain, draw, or otherwise demonstrate a life cycle with more than three stages</b>.</p> <p>A4. <b>Given a collection of objects</b>, student can <b>sort them into three groups and describe the "rule" by which</b> each group was <b>sorted</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>A1. Identify the differences between living and non-living things.</b></p> <p><b>A2. Describe characteristics of different living things.</b></p> <p><b>A3. Explain, draw, or otherwise demonstrate the life cycle of an organism.</b></p> <p><b>A4. Design and describe a classification system for objects.</b></p>

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<p>Portfolio contains evidence that:</p> <p>A1. Student can <b>identify two characteristics</b> of <b>four organisms</b>.</p> <p>A2. Student can <b>classify organisms</b> in simple terms, <b>given categories</b> (ex., living/non-living, plant/animal).</p> <p>A3. Student can <b>identify two different living things</b> within a <b>given habitat</b>.</p> <p>A4. Student can <b>describe/demonstrate</b> the <b>structure, behavior, or life cycle</b> of <b>an organism</b>.</p>	<p>Portfolio contains evidence that:</p> <p>A1. Student can <b>identify two characteristics of four</b> given organisms and <b>group them</b> based on those characteristics.</p> <p>A2. Student can <b>describe/demonstrate a classification system</b> for organisms <b>based on one characteristic</b>.</p> <p>A3. Student can <b>name three</b> living things within a <b>given habitat</b>.</p> <p>A4. Student can <b>compare and contrast</b> the <b>structure, behavior or life cycle</b> of <b>two</b> different organisms.</p>	<p>Portfolio contains evidence that:</p> <p>A1. Student can <b>group four organisms in two different ways</b> using different characteristics.</p> <p>A2. Student can <b>describe/demonstrate and design a classification system</b> for organisms <b>based on two characteristics</b>.</p> <p>A3. Student can explain, draw, or otherwise <b>describe three different living things</b> within a <b>given habitat</b>.</p> <p>A4. Student can <b>compare and contrast</b> the <b>structure and behavior</b> of <b>two</b> different organisms.</p>	<p>Portfolio contains evidence that:</p> <p>A1. Student can <b>group four organisms in three different ways</b> using different characteristics.</p> <p>A2. Student can <b>describe/demonstrate and design a classification system</b> for organisms <b>based on three</b> characteristics.</p> <p>A3. Student can explain, draw, or otherwise <b>describe four different living things</b> within a <b>given habitat</b>.</p> <p>A4. Student can <b>compare and contrast</b> the <b>structure, behavior, and life cycles</b> of <b>two</b> different organisms.</p>	<p><b>Students will be able to:</b></p> <p><b>A1. Group the same organisms in different ways using different characteristics.</b></p> <p><b>A2. Design and describe a classification system for organisms.</b></p> <p><b>A3. Describe the different living things within a given habitat.</b></p> <p><b>A4. Compare and contrast the life cycles, behavior, and structure of different organisms.</b></p>

# Science & Technology Content Standard B - Ecology

# PAAP Rubric Level 1

*Students will understand how living things depend on one another and on non-living aspects of the environment.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p><b>B1. Student can match a picture of an organism to one thing from the environment on which it depends</b> (ex., Student can identify pictures of elements they need to survive).</p> <p><b>B2. Student can identify</b> things that are <b>food</b> and things that are <b>not food</b>.</p> <p><b>B3. Student can, when asked, make a change in his/her environment</b> (ex., turn the lights on or off, move a classroom object, change his/her position).</p> <p><b>B4. Student can identify objects from his her own environment</b> ("ecological system").</p> <p><b>B5. Student can identify one or more objects from a familiar local environment</b> among a <b>given group</b> of two or more objects.</p>	<p>Portfolio contains evidence that:</p> <p><b>B1. Student can match a picture of an organism to two things in its environment on which it depends.</b></p> <p><b>B2. Student can match three animals to the plants on which they depend for food.</b></p> <p><b>B3. Student can draw, explain, or otherwise describe the effect(s) of one change in an environment.</b></p> <p><b>B4. From a group of pictures/objects, student can choose those that match one ecological system on earth.</b></p> <p><b>B5. Student can draw, or otherwise describe two objects from a familiar local environment.</b></p>	<p>Portfolio contains evidence that:</p> <p><b>B1. Student can identify two ways in which organisms depend upon their environment.</b></p> <p><b>B2. Student can describe/demonstrate how the food of six animals can be traced back to plants.</b></p> <p><b>B3. Student can give two examples of how one change in a system affects other parts of the system.</b></p> <p><b>B4. Student can draw, explain, or otherwise describe two ecological systems on earth.</b></p> <p><b>B5. Student can draw, explain, or otherwise describe three objects from a familiar local environment.</b></p>	<p>Portfolio contains evidence that:</p> <p><b>B1. Student can identify three ways in which organisms depend upon their environment.</b></p> <p><b>B2. Student can describe/demonstrate how almost all animals' food can be traced back to plants.</b></p> <p><b>B3. Student can give three examples of how one change in a system affects other parts of the system.</b></p> <p><b>B4. Student can draw, explain, or otherwise describe three ecological systems on earth.</b></p> <p><b>B5. Student can draw, explain, or otherwise describe four objects from a familiar local environment.</b></p>	<p><b>Students will be able to:</b></p> <p><b>B1. Identify ways that organisms depend upon their environment.</b></p> <p><b>B2. Describe how almost all animals' food can be traced back to plants.</b></p> <p><b>B3. Give examples of how one change in a system affects other parts of the system.</b></p> <p><b>B4. Describe different ecological systems on earth.</b></p> <p><b>B5. Describe a familiar local environment.</b></p>

## Science & Technology Content Standard B - Ecology

## PAAP Rubric Level 2

*Students will understand how living things depend on one another and on non-living aspects of the environment.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>B1. Student can <b>identify two</b> particular <b>organisms in a given food web</b>.</p> <p>B2. Student can <b>sort a given group</b> of organisms <b>into producers</b> (e.g., green plants) <b>and consumers</b> (e.g., those that eat green plants).</p> <p>B3. Student can <b>identify the characteristics of one biome</b> (i.e., regions characterized by their climate and plant life - tundra, rain forest, ocean, desert).</p> <p>B4. Student can <b>identify two major living or two non-living components of a local ecosystem</b> after investigation.</p>	<p>Portfolio contains evidence that:</p> <p>B1. Student can <b>identify</b> the particular <b>organisms in a given food web</b> and <b>place them in</b> an appropriate <b>sequence</b> to form a <b>cycle</b>.</p> <p>B2. Student can <b>explain/demonstrate</b> the <b>difference between producers</b> (e.g., green plants), <b>and consumers</b> (e.g., those that eat green plants).</p> <p>B3. Student can <b>describe/demonstrate understanding of two different biomes</b> (i.e., regions characterized by their climate and plant life - tundra, rain forest, ocean, desert).</p> <p>B4. Student can <b>identify two major living and two or more non-living components of a local ecosystem</b> after investigation.</p>	<p>Portfolio contains evidence that:</p> <p>B1. Student can <b>describe/demonstrate a food web</b> and <b>one relationship</b> within a <b>given ecosystem</b>.</p> <p>B2. Student can <b>explain/demonstrate</b> the <b>difference between producers</b> (e.g., green plants) <b>and consumers</b> (e.g., those that eat green plants), and <b>identify a decomposer</b> (e.g., bacteria that break down the "consumers" when they die).</p> <p>B3. Student can <b>compare and contrast two physical and two living components of different biomes</b> (i.e., regions characterized by their climate and plant life - tundra, rain forest, ocean, desert).</p> <p>B4. Student can <b>describe/demonstrate</b> the <b>connection between a major living and a non-living component of a local ecosystem</b> after investigation.</p>	<p>Portfolio contains evidence that:</p> <p>B1. Student can <b>describe/demonstrate a food web</b> and the <b>relationships</b> within a <b>given ecosystem</b>.</p> <p>B2. Student can <b>explain/demonstrate</b> the <b>differences among producers</b> (e.g., green plants), <b>consumers</b> (e.g., those that eat green plants), <b>and decomposers</b> (e.g., bacteria that break down the "consumers" when they die), and identify examples of each.</p> <p>B3. Student can <b>compare and contrast three physical and three living components of different biomes</b> (i.e., regions characterized by their climate and plant life - tundra, rain forest, ocean, desert).</p> <p>B4. Student can <b>describe/demonstrate connections</b> between <b>two major living and non-living components of a local ecosystem</b> after investigation.</p>	<p><b>Students will be able to:</b></p> <p><b>B1. Describe a food web and the relationships within an ecosystem.</b></p> <p><b>B2. Explain the difference between producers (e.g., green plants), consumers (e.g., those that eat green plants), and decomposers (e.g., bacteria that break down the "consumers" when they die), and identify examples of each.</b></p> <p><b>B3. Compare and contrast physical and living components of different biomes - i.e., regions characterized by their climate and plant life - (e.g., tundra, rain forest, ocean, desert).</b></p> <p><b>B4. Investigate the connection between major living and non-living components of a local ecosystem.</b></p>

*Students will understand that cells are the basic units of life.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>C1. Student can <b>indicate</b> at least <b>two different parts of a living thing</b> when the <b>names of those parts</b> and the <b>living thing</b> are <b>given</b>.</p> <p>C2. Student can <b>match two living things to the food(s)</b> they eat.</p> <p>C3. Student will <b>use a magnifying device</b> for an appropriate purpose.</p> <p>C4. Student can <b>communicate</b> to others <b>when they are not</b> feeling <b>well</b> or are experiencing pain.</p>	<p>Portfolio contains evidence that:</p> <p>C1. Student can <b>indicate three different parts of two living things</b> when the <b>names of those parts</b> are <b>given</b>.</p> <p>C2. From a <b>group of five or fewer pictures</b> including <b>living and non-living things</b>, student can <b>identify those that need food and water</b> to survive.</p> <p>C3. Student will <b>use a magnifying device and match pictures of what</b> he/she <b>sees first with the naked eye</b>, and <b>what</b> he/she <b>sees using the magnifying device</b>.</p> <p>C4. Student can <b>match symptoms to two common diseases</b>.</p>	<p>Portfolio contains evidence that:</p> <p>C1. <b>Given a group of twelve</b> different <b>parts</b> and the <b>names of four</b> living things, the student can <b>match the parts to the related whole</b>.</p> <p>C2. From a <b>group of five or fewer pictures</b> including <b>animals, plants, and non-living things</b>, student can <b>identify those that need food, water, and gases</b> to survive.</p> <p>C3. Student can <b>use two types of magnifying devices</b> and <b>identify the difference it makes in size of the image (makes the image larger)</b>.</p> <p>C4. Student can <b>provide an example of the cause</b> of a disease.</p>	<p>Portfolio contains evidence that:</p> <p>C1. Student can explain or otherwise <b>demonstrate understanding</b> that all <b>living things are made up of different parts</b>.</p> <p>C2. Student can draw, explain, or otherwise <b>demonstrate understanding of the concept</b> that <b>plants and animals need food, water, and gases</b> to survive.</p> <p>C3. Student can <b>use two types of magnifying devices</b> and <b>identify details that can be seen only through the magnified image</b>.</p> <p>C4. Student can <b>provide two examples of causes</b> of diseases.</p>	<p><b>Students will be able to:</b></p> <p><b>C1. Demonstrate that living things are made up of different parts.</b></p> <p><b>C2. Demonstrate an understanding that plants and animals need food, water, and gases to survive.</b></p> <p><b>C3. Explore magnifying devices and how they allow one to see in more detail.</b></p> <p><b>C4. Provide examples of causes of diseases.</b></p>

*Students will understand that cells are the basic units of life.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>C1. Student can <b>match six</b> living things to their parts.</p> <p>C2. Student can <b>describe/demonstrate</b> the <b>characteristics of a single-celled organism</b> (i.e., is one celled and is alive).</p> <p>C3. Student can <b>describe/demonstrate</b> the <b>function of a microscope</b>.</p> <p>C4. Student can <b>identify parts of one</b> given major <b>human organ system</b> when <b>presented among parts from three</b> or more human organ systems.</p>	<p>Portfolio contains evidence that:</p> <p>C1. Student can <b>describe/demonstrate</b> that <b>living things are made up of smaller parts</b>.</p> <p>C2. Student can <b>list what a single celled organism needs</b> in order to stay alive (ex., food, water, and/or gases).</p> <p>C3. Student can <b>use a microscope</b> to see given objects.</p> <p>C4. Student can <b>describe/demonstrate</b> the <b>functions of two</b> major <b>human organ systems</b>.</p>	<p>Portfolio contains evidence that:</p> <p>C1. Student can <b>explain/demonstrate understanding</b> that the <b>smaller parts of living things are made up of cells</b>.</p> <p>C2. Student can <b>describe/demonstrate how one single-celled organism exists</b>.</p> <p>C3. Student can <b>use a microscope to identify a cell</b>.</p> <p>C4. Student can <b>describe/demonstrate</b> the <b>functions of three</b> major <b>human organ systems</b>.</p>	<p>Portfolio contains evidence that:</p> <p>C1. Student can <b>explain/demonstrate understanding</b> that <b>a cell is the basic unit of living organisms</b>.</p> <p>C2. Student can <b>describe/demonstrate how two single-celled organisms exist</b>.</p> <p>C3. Student can <b>use a microscope to see cells</b> in a variety of <b>organisms</b>.</p> <p>C4. Student can <b>describe/demonstrate</b> the <b>functions of four</b> major <b>human organ systems</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>C1. Demonstrate an understanding that a cell is the basic unit of living organisms.</b></p> <p><b>C2. Describe how single-celled organisms exist.</b></p> <p><b>C3. Explore how the use of a microscope allows one to see cells in a variety of organisms.</b></p> <p><b>C4. Describe the functions of the major human organ systems.</b></p>

*Students will understand the basis for all life and that all living things change over time.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>D1. Student can <b>match a picture or object of an organism to its corresponding fossil</b> (e.g., fern to fern fossil).</p> <p>D2. Student can <b>identify two organisms</b>.</p> <p>D3. Student can <b>match</b> pictures of <b>two stages in the life cycle of a given organism to the adult form</b> of the organism (ex., tadpole/frog, seed/plant).</p> <p>D4. Student can <b>identify one way in which humans are alike</b> (e.g., student can identify one characteristic that he/she has in common with other people).</p>	<p>Portfolio contains evidence that:</p> <p>D1. Student can draw, explain, or otherwise <b>demonstrate understanding</b> that <b>dead organisms leave remnants</b>.</p> <p>D2. Student can <b>match three organisms to their environments</b>.</p> <p>D3. Student can <b>put three stages of one life cycle in</b> correct sequence.</p> <p>D4. Student can <b>identify one way in which individuals of the same species, other than human, are alike</b>.</p>	<p>Portfolio contains evidence that:</p> <p>D1. Student can draw, explain, or otherwise <b>demonstrate understanding</b> that <b>remains may turn into fossils</b>.</p> <p>D2. Student can <b>identify characteristics of three organisms</b>.</p> <p>D3. Student can <b>identify and</b> draw, describe, or respond to questions in order to <b>demonstrate understanding of three stages of one life cycle</b>.</p> <p>D4. Student can <b>describe/demonstrate one way in which individuals of the same species are alike</b>, and <b>one way</b> in which they are <b>different</b>.</p>	<p>Portfolio contains evidence that:</p> <p>D1. Student can draw, explain, or otherwise <b>demonstrate understanding of how fossils show the existence of past life</b>.</p> <p>D2. Student can <b>identify characteristics that help three organisms live in their environment</b>.</p> <p>D3. Student can draw, describe, or respond to questions in order to <b>demonstrate understanding of ways in which an organism can change over its lifetime, sometimes in predictable ways</b> (e.g., butterfly, frog).</p> <p>D4. Student can <b>describe/demonstrate two ways in which individuals of the same species are alike and two ways in which they are different</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>D1. Explain how fossils show the existence of past life.</b></p> <p><b>D2. Identify characteristics that help organisms live in their environment.</b></p> <p><b>D3. Draw or describe ways in which an organism can change over its lifetime, sometimes in predictable ways (e.g., butterfly, frog).</b></p> <p><b>D4. Describe ways in which individuals of the same species are alike and different.</b></p>



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<p>Portfolio contains evidence that:</p> <p>D1. Student can <b>identify</b> three present day <b>organisms that have not always existed</b>.</p> <p>D2. Student can draw or <b>otherwise demonstrate understanding of the definition of the word "fossil"</b>.</p> <p>D3. Student can <b>identify an adaptation</b> that helps an organism live (ex., moist frog skin for respiration).</p> <p>D4. Student can <b>demonstrate two ways</b> in which <b>organisms</b> may be <b>similar to their parents, or two ways</b> in which they are <b>different from their parents</b>.</p>	<p>Portfolio contains evidence that:</p> <p>D1. Student can <b>identify three</b> present day <b>organisms that have not always existed</b>, and <b>one organism that no longer exists</b>.</p> <p>D2. Student can <b>identify</b> the <b>environmental factors that would cause a fossil</b> to form.</p> <p>D3. Student can <b>describe/demonstrate how adaptations may change over time</b>.</p> <p>D4. Student can <b>describe/demonstrate two ways</b> in which <b>organisms</b> may be <b>similar to their parents and one way</b> in which they may be <b>different from their parents</b>.</p>	<p>Portfolio contains evidence that:</p> <p>D1. <b>Student can identify three present day organisms that have not always existed, and two organisms that no longer exist</b>.</p> <p>D2. Student can <b>describe/demonstrate one aspect of the process</b> of how <b>fossils form</b>.</p> <p>D3. Student can <b>describe/demonstrate how adaptations</b>, in response to change over time, <b>increased the chances of survival</b> for a specific species.</p> <p>D4. <b>Student can describe/demonstrate three ways</b> in which <b>organisms</b> may be <b>similar to their parents and two ways</b> in which they may be <b>different from their parents</b>.</p>	<p>Portfolio contains evidence that:</p> <p>D1. Student can <b>identify four present day organisms that have not always existed</b>, and <b>three past life forms that have become extinct</b>.</p> <p>D2. Student can <b>describe/demonstrate how fossils form</b>.</p> <p>D3. Student can <b>describe/demonstrate how adaptations</b>, in response to change over time, <b>may increase a species' chances of survival</b>.</p> <p>D4. Student can <b>describe/demonstrate three ways</b> in which <b>organisms</b> may be <b>similar to their parents, three ways</b> in which they may be <b>different from their parents, and suggest one possible reason</b> for this.</p>	<p><b>Students will be able to:</b></p> <p><b>D1. Identify present day organisms that have not always existed, and past life forms that have become extinct.</b></p> <p><b>D2. Describe how fossils form.</b></p> <p><b>D3. Explain how adaptations, in response to change over time, may increase a species' chances of survival.</b></p> <p><b>D4. Describe ways in which organisms may be similar to and different from their parents and explore the possible reasons for this.</b></p>



*Students will understand the structure of matter and the changes it can undergo.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>E1. Student can <b>point to two different pieces/parts belonging to an object</b> when the <b>names of the object and/or a group</b> made up of related and unrelated parts <b>are given</b> (ex., body, car, building, animal, plant, recipe, jigsaw puzzle).</p> <p>E2. Student can <b>identify one physical property</b> (ex., color, size, texture) <b>of one</b> given object.</p> <p>E3. Given a set of <b>two</b> to <b>four</b> objects, the student can choose the one that has a specific observable characteristic (ex., "Show me the one that is red.").</p>	<p>Portfolio contains evidence that:</p> <p>E1. Student can <b>match three pieces/parts</b> of <b>two</b> given objects to the <b>whole</b> of which they are a part (ex., body, car, jigsaw puzzle).</p> <p>E2. Student can <b>identify two physical properties</b> (ex., color, size, texture) of <b>one</b> given objects.</p> <p>E3. Given a set of four or more objects, the student can identify all the ones that have the same specific observable characteristic (ex., "Show me all the objects that are red.").</p>	<p>Portfolio contains evidence that:</p> <p>E1. <b>Given a group of twelve different pieces/parts and pictures/names of four different objects</b>, the student can <b>match the pieces to</b> the related <b>object</b>.</p> <p>E2. Student can <b>describe/demonstrate one physical property</b> (ex., color, size, texture) <b>of one</b> given <b>object</b>.</p> <p>E3. Student can sort a set of objects based on two observable characteristics (ex., one sort based on color and a second sort based on size).</p>	<p>Portfolio contains evidence that:</p> <p>E1. Student can draw, describe, or otherwise <b>show understanding of the concept</b> that <b>large things are made up of smaller pieces/parts</b>.</p> <p>E2. Student can <b>describe/demonstrate two physical properties</b> (ex., color, size, texture) <b>of two</b> different objects.</p> <p>E3. Student can group objects based on three or more observable characteristics (ex., one sort based on color, one sort based on size, and a third sort based on texture).</p>	<p><b>Students will be able to:</b></p> <p><b>E1. Show that large things are made up of smaller pieces.</b></p> <p><b>E2. Describe some physical properties of objects.</b></p> <p><b>E3. Group objects based on observable characteristics (e.g., color, size, texture).</b></p>

*Students will understand the structure of matter and the changes it can undergo.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	<i>Learning Results</i> Performance Indicators
<p>Portfolio contains evidence that:</p> <p>E1. Student can <b>describe/demonstrate two physical properties</b> of three given objects.</p> <p>E2. Student can define or otherwise <b>demonstrate understanding of the <u>concept</u> of "matter"</b>.</p>	<p>Portfolio contains evidence that:</p> <p>E1. Student can <b>identify a possible change in a physical property</b> of a given object.</p> <p>E2. Student can <b>describe/demonstrate understanding of the <u>concepts</u> of "matter" and physical changes</b> in matter.</p>	<p>Portfolio contains evidence that:</p> <p>E1. Student can <b>identify a possible change in the physical properties of given objects when one object chemically combines with another</b> (e.g., rust).</p> <p>E2. Student can <b>describe/demonstrate the meaning of "matter" and identify examples of physical and chemical changes</b> in matter.</p>	<p>Portfolio contains evidence that:</p> <p>E1. Student can <b>describe how the physical properties of objects sometimes change when one object chemically combines with another.</b></p> <p>E2. Student can <b>describe/demonstrate how matter changes in both chemical and physical ways.</b></p>	<p><b>Students will be able to:</b></p> <p><b>E1. Describe how the physical properties of objects sometimes change when one object chemically combines with another.</b></p> <p><b>E2. Explain how matter changes in both chemical and physical ways.</b></p>

*Students will gain knowledge about the earth and the processes that change it.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>identify 2 characteristic(s) of the weather</b> on a given <b>day</b>.</p> <p>F2. <b>Given pictures</b> related to <b>seasons</b> of the year, <b>and the name of a season</b>, the <b>student can indicate the picture(s)</b> appropriate to the <b>named season</b>.</p> <p>F3. Student can <b>identify two</b> of the following weather factors: <b>water, snow, wind, and ice</b>.</p>	<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>compare the weather on two</b> climatically different <b>days</b> (e.g., snowy/rainy).</p> <p>F2. Student can <b>identify the four seasons</b> and <b>match</b> each <b>to pictures</b> of that season.</p> <p>F3. Student can <b>identify water, snow, wind, and ice</b>.</p>	<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>describe/demonstrate two kinds of weather changes</b></p> <p>F2. Student can <b>draw a conclusion about the relationships</b> between <b>observable weather patterns</b> and the <b>cycling</b> of seasons.</p> <p>F3. Student can observe <b>(identify) a change</b> that is <b>caused by each of two</b> of the following factors: <b>water, snow, wind, ice</b>.</p>	<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>describe/demonstrate three ways</b> in which <b>weather changes</b>.</p> <p>F2. Student can <b>draw two conclusions about the relationships</b> between <b>observable weather patterns</b> and the <b>cycling</b> of the seasons.</p> <p>F3. Student can observe <b>(identify) a change</b> that is <b>caused by each of the following factors: water, snow, wind, ice</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>F1. Describe the way weather changes.</b></p> <p><b>F2. Analyze the relationships between observable weather patterns and the cycling of the seasons.</b></p> <p><b>F3. Observe changes that are caused by water, snow, wind, and ice.</b></p>

*Students will gain knowledge about the earth and the processes that change it.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>identify the continents</b> on a map.</p> <p>F2. Student can give an <b>example of one thing about the earth</b> (ex., climate) that occurs in <b>cycles</b>.</p> <p>F3. Student can <b>differentiate among rocks, minerals, and soils</b>.</p> <p>F4. Student can define or otherwise <b>demonstrate understanding of "a cycle"</b>.</p>	<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>indicate the continents on a map</b> and <b>describe/demonstrate understanding of the <u>concept</u> of "continent"</b>.</p> <p>F2. Student can give <b>two examples of things about the earth</b> (ex., climate) that occur in <b>cycles</b>.</p> <p>F3. Student can <b>identify two differences among rocks, minerals, and soils</b>.</p> <p>F4. Student can <b>identify three stages of a cycle</b> for a <b>non-living thing</b> (e.g., water cycle or rock cycle).</p>	<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>describe/demonstrate the <u>concept</u> that continents change in position</b> over time.</p> <p>F2. Student can <b>demonstrate an understanding of three things about the earth</b> (ex., climate) that occur in <b>cycles</b>.</p> <p>F3. Student can <b>describe/demonstrate three differences among minerals, rocks, and soils</b>.</p> <p>F4. Student can indicate how <b>water</b> goes through a <b>cyclic process of change</b> in the environment.</p>	<p>Portfolio contains evidence that:</p> <p>F1. Student can <b>describe/demonstrate the change in position of the continents</b> over time.</p> <p>F2. Student can <b>demonstrate an understanding of four or more things about the earth</b> (ex., climate) that occur in <b>cycles</b> that <b>vary</b> in length and frequency.</p> <p>F3. Student can <b>describe/demonstrate four differences among minerals, rocks, and soils</b>.</p> <p>F4. Student can <b>illustrate how water and one other substance</b> go through a <b>cyclic process of change</b> in the environment.</p>	<p><b>Students will be able to:</b></p> <p><b>F1. Describe the change in position of the continents over time.</b></p> <p><b>F2. Demonstrate an understanding that many things about the earth (e.g., climate) occur in cycles that vary in length and frequency.</b></p> <p><b>F3. Describe differences among minerals, rocks, and soils.</b></p> <p><b>F4. Illustrate how water and other substances go through a cyclic process of change in the environment.</b></p>

# Science & Technology Content Standard G - The Universe

# PAAP Rubric Level 1

*Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>G1. Student can <b>identify night and day.</b></p> <p>G2. Student can <b>identify a shadow.</b></p> <p>G3. Student can <b>identify where the sun or stars are found</b> (e.g., point to the sky).</p>	<p>Portfolio contains evidence that:</p> <p>G1. Student can <b>describe/demonstrate two or more differences between night and day and identify the seasons.</b></p> <p>G2. Student, <b>using concrete objects</b>, can <b>create shadows</b> when asked to do so.</p> <p>G3. <b>Given pictures/models</b> of the <b>sun and stars</b>, the student can <b>identify</b> each.</p>	<p>Portfolio contains evidence that:</p> <p>G1. Student can <b>describe/demonstrate the position of the sun relative to the Earth in explaining day and night and place the seasons in sequence.</b></p> <p>G2. Student can, <b>using concrete objects</b>, <b>move the shadows</b> of objects by <b>changing the direction from which light is coming.</b></p> <p>G3. Student can <b>identify the sun as one of many stars.</b></p>	<p>Portfolio contains evidence that:</p> <p>G1. Student can <b>describe/demonstrate the cycles of day/night and of seasons.</b></p> <p>G2. Student can <b>describe/demonstrate two situations</b> in which the <b>shadows of objects change based on where light is coming from.</b></p> <p>G3. Student can <b>demonstrate understanding</b> that the <b>sun is one of many stars</b> in the universe and is the <b>closest star to earth.</b></p>	<p><b>Students will be able to:</b></p> <p><b>G1. Explain the cycles of day/night and of seasons.</b></p> <p><b>G2. Demonstrate that shadows of objects change based on where light are coming from.</b></p> <p><b>G3. Demonstrate an understanding that the sun is one of many stars in the universe and is the closest star to earth.</b></p>

## Science & Technology Content Standard G - The Universe

## PAAP Rubric Level 2

*Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>G1. Student can illustrate or otherwise <b>describe</b> the <b>relative positions</b> of the <b>sun</b> and <b>Earth</b>.</p> <p>G2. Student can <b>demonstrate understanding</b> that the <b>sun produces heat or light</b>.</p> <p>G3. Student can <b>demonstrate understanding of</b> the <b>concept</b> of "<b>rotation</b>" <b>or</b> "<b>revolution</b>".</p> <p>G4. Student can <b>identify that</b> the <b>moon</b> orbits or <b>revolves around</b> the <b>earth</b>.</p>	<p>Portfolio contains evidence that:</p> <p>G1. Student can illustrate or otherwise <b>describe</b> the <b>relative positions</b> of the <b>sun</b>, <b>moon</b>, and <b>Earth</b>.</p> <p>G2. Student can <b>demonstrate understanding</b> that the <b>sun produces heat and light</b>.</p> <p>G3. Student can <b>demonstrate understanding of</b> the <b>concepts</b> of "<b>rotation</b>" <b>and</b> "<b>revolution</b>".</p> <p>G4. Student can <b>identify ways</b> in which the <b>moon affects natural cycles</b> on earth (e.g., tides).</p>	<p>Portfolio contains evidence that:</p> <p>G1. Student can illustrate or otherwise <b>describe</b> the <b>relative positions</b> of the <b>sun</b>, <b>moon</b>, <b>Earth</b> and <b>two other planets</b>.</p> <p>G2. Student can <b>trace the source of Earth's heat or light energy</b> to the sun.</p> <p>G3. Student can <b>describe/demonstrate the earth's rotation</b> on its axis and its <b>relationship to day length</b>.</p> <p>G4. Student can <b>list facts about</b> the <b>relationship between</b> the <b>earth and its moon</b> (ex., revolves around the earth, reflects light from the sun to earth).</p>	<p>Portfolio contains evidence that:</p> <p>G1. Student can illustrate or otherwise <b>describe</b> the <b>relative positions</b> of the <b>sun</b>, <b>moon</b>, and <b>planets</b>.</p> <p>G2. Student can <b>trace the sources of Earth's heat and light energy</b> to the sun.</p> <p>G3. Student can <b>describe/demonstrate the earth's rotation</b> on its axis <b>and earth's revolution</b> around the sun.</p> <p>G4. Student can <b>draw conclusions</b> about the <b>relationship between</b> the <b>earth and its moon</b> (ex., observe and draw/otherwise explain the moon's revolution around the earth, chart the phases of the moon).</p>	<p><b>Students will be able to:</b></p> <p><b>G1. Illustrate the relative positions of the sun, moon, and planets.</b></p> <p><b>G2. Trace the sources of earth's heat and light energy to the sun.</b></p> <p><b>G3. Describe earth's rotation on its axis and its revolution around the sun.</b></p> <p><b>G4. Explore the relationship between the earth and its moon.</b></p>

*Students will understand concepts of energy.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	<i>Learning Results</i> Performance Indicators
<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>identify source of light</b> (lamp, sun, flashlight) <b>or heat</b> (radiator, stove, sun).</p> <p>H2. Student can <b>match two</b> things with their <b>source of energy</b>.</p>	<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>identify indoor and outdoor sources of heat and light</b>.</p> <p>H2. Student can <b>identify the source of energy for six or fewer living things</b>.</p>	<p>Portfolio contains evidence that:</p> <p>H1. Student can draw, <b>describe</b>, or otherwise explain that the <b>sun gives off light or heat</b> energy.</p> <p>H2. Student can <b>describe/demonstrate what energy does for three living things</b>.</p>	<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>describe/demonstrate an understanding</b> that the <b>sun gives off light and heat</b> energy.</p> <p>H2. Student can <b>describe/demonstrate why living things need energy</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>H1. Demonstrate an understanding that the sun gives off light and heat energy.</b></p> <p><b>H2. Explain why living things need energy.</b></p>



*Students will understand concepts of energy.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	<i>Learning Results</i> Performance Indicators
<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>demonstrate understanding of the concept of "energy"</b>.</p> <p>H2. Student can <b>explain/demonstrate two ways one form of energy</b> can be produced.</p>	<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>identify one form of energy</b> (e.g., light, sound, heat).</p> <p>H2. Student can <b>explain/demonstrate one way each of two forms of energy</b> can be produced.</p>	<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>identify two forms of energy</b> (e.g., light, sound, heat).</p> <p>H2. Student can <b>explain/demonstrate two ways two different forms of energy</b> can be produced.</p>	<p>Portfolio contains evidence that:</p> <p>H1. Student can <b>identify three different forms of energy</b> (e.g., light, sound, heat).</p> <p>H2. Student can <b>explain/demonstrate ways four different forms of energy</b> can be produced.</p>	<p><b>Students will be able to:</b></p> <p><b>H1. Identify different forms of energy (e.g., light, sound, heat).</b></p> <p><b>H2. Explain ways different forms of energy can be produced.</b></p>

*Students will understand the motion of objects and how forces can change that motion.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p><b>I1. Student can identify/demonstrate one way</b> (ex., forward, backward, straight, zigzag, up, down, fast, slow, etc.) <b>in which an object can move.</b></p> <p><b>I2. Student can demonstrate a change in motion</b> (ex., stop/go, run/walk, forward/backward).</p>	<p>Portfolio contains evidence that:</p> <p><b>I1. Student can identify/demonstrate two ways</b> (ex., forward, backward, straight, zigzag, up, down, fast, slow, etc.) <b>in which an object can move.</b></p> <p><b>I2. Student can describe/demonstrate three different changes of motion.</b></p>	<p>Portfolio contains evidence that:</p> <p><b>I1. Student can describe/demonstrate three ways</b> (ex. forward, backward, straight, zigzag, up, down, fast, slow, etc.) <b>in which an object can move.</b></p> <p><b>I2. Student can describe/demonstrate one way in which the motion of a given object can be changed.</b></p>	<p>Portfolio contains evidence that:</p> <p><b>I1. Student can describe/demonstrate six ways</b> (ex., forward, backward, straight, zigzag, up, down, fast, slow, etc.) <b>in which an object can move.</b></p> <p><b>I2. Student can describe/demonstrate that the motion of an object can be changed.</b></p>	<p><b>Students will be able to:</b></p> <p><b>I1. Develop a variety of ways to describe the motion of an object.</b></p> <p><b>I2. Demonstrate that the motion of an object can be changed.</b></p>

*Students will understand the motion of objects and how forces can change that motion.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>I1. Student can <b>match</b> different <b>types of force</b> (e.g., mechanical, electrical, magnetic) <b>to</b> their <b>definitions</b>.</p> <p>I2. Student can <b>describe/demonstrate</b> the <b>differences</b> <b>between more massive and less massive</b> objects.</p> <p>I3. Student can <b>record</b> the <b>reactions</b> when <b>five different objects</b> varying in size, weight, and/or shape <b>are pushed or pulled</b>.</p>	<p>Portfolio contains evidence that:</p> <p>I1. Student can <b>describe/demonstrate</b> the <b>effects of a type of force</b> (e.g., mechanical, electrical, magnetic) <b>on motion</b>.</p> <p>I2. Student can <b>describe/demonstrate</b> <b>how</b> the <b>amount of force affects</b> the <b>motion of two</b> objects.</p> <p>I3. Student can <b>predict</b> the <b>reaction force</b> generated by <b>pushing or pulling three</b> different <b>objects</b>.</p>	<p>Portfolio contains evidence that:</p> <p>I1. Student can <b>describe/demonstrate</b> the <b>effects of two types of force</b> (e.g., mechanical, electrical, magnetic) <b>on motion</b>.</p> <p>I2. Student can <b>describe/demonstrate</b> <b>how</b> the <b>amount of force affects</b> the <b>motion of three</b> objects <b>which differ significantly in mass</b>.</p> <p>I3. Student can <b>generate three examples</b> illustrating that when <b>something is pushed or pulled, it exerts a reaction force</b>.</p>	<p>Portfolio contains evidence that:</p> <p>I1. Student can <b>describe/demonstrate</b> the <b>effects of three</b> different <b>types of force</b> (e.g., mechanical, electrical, magnetic) <b>on motion</b>.</p> <p>I2. Student can <b>draw conclusions about</b> <b>how</b> the <b>amount of force affects</b> the <b>motion of four</b> more massive and less massive objects.</p> <p>I3. Student can <b>generate four examples</b> illustrating that <b>when something is pushed or pulled, it exerts a reaction force</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>I1. Describe the effects of different types of forces (e.g., mechanical, electrical, magnetic) on motion.</b></p> <p><b>I2. Draw conclusions about how the amount of force affects the motion of more massive and less massive objects.</b></p> <p><b>I3. Generate examples illustrating that when something is pushed or pulled, it exerts a reaction force.</b></p>

# Science & Technology Content Standard J - Inquiry and Problem Solving

# PAAP Rubric Level 1

*Students will apply inquiry and problem-solving approaches in science and technology.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>J1. Student can <b>sort given objects into two groups</b> based on the <b>characteristics of measurements</b> of the objects (ex., which is longer/shorter, wider/skinnier, bigger/smaller, etc.).</p> <p>J2. Student can <b>choose</b> from <b>given options</b>, an appropriate <b>strategy to answer a given question</b>.</p> <p>J3. Student can <b>copy a pattern</b> with <b>two components</b>.</p> <p>J4. Student can <b>use a product to solve a problem</b> in daily life (ex., to get from one level to another in a building/ramp, selecting a cup as the appropriate container for a liquid).</p>	<p>Portfolio contains evidence that:</p> <p>J1. Student can <b>identify an appropriate tool</b> (standard or non-standard) to use <b>for a required measurement</b> (ex., ruler to measure length of foot).</p> <p>J2. Student can <b>use</b> an appropriate <b>strategy to answer a given question</b>.</p> <p>J3. Student can <b>recognize, copy, and extend a pattern</b> with <b>two components</b>.</p> <p>J4. Student can <b>match a product with the problem it was invented to solve</b> (ex., toothbrush, eyeglasses).</p>	<p>Portfolio contains evidence that:</p> <p>J1. <b>Student can make an accurate observation using the appropriate tool and unit of measure for a required measurement.</b></p> <p>J2. Student can <b>generate questions and propose strategies to use</b> in answering them.</p> <p>J3. <b>Given two choices</b>, student can <b>make a prediction based on a pattern</b> they have observed.</p> <p>J4. Student can <b>identify a product and the problem it was designed to solve</b>.</p>	<p>Portfolio contains evidence that:</p> <p>J1. Student can <b>make accurate observations using appropriate tools and units of measure</b>.</p> <p>J2. Student can <b>ask questions and propose strategies and materials to use</b> in seeking answers to them.</p> <p>J3. Student can <b>use results</b> in a purposeful way, which includes <b>making two or more predictions based on patterns</b> they have observed.</p> <p>J4. Student can <b>identify two or more products</b> that were <b>invented to solve a problem and the problem</b> they were designed to solve.</p>	<p><b>Students will be able to:</b></p> <p><b>J1. Make accurate observations using appropriate tools and units of measure.</b></p> <p><b>J2. Ask questions and propose strategies and materials to use in seeking answers to questions.</b></p> <p><b>J3. Use results in a purposeful way, which includes making predictions based on patterns they have observed.</b></p> <p><b>J4. Identify products which were invented to solve a problem.</b></p>

*Students will apply inquiry and problem-solving approaches in science and technology.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>J1. <b>Given objects</b>, student can <b>make an observation</b> that <b>can be measured</b> (time, length, area, perimeter, weight, temperature, mass, capacity, volume) <b>using a standard tool</b>, and <b>identify</b> the appropriate <b>tool</b>.</p> <p>J2. Student can <b>follow given steps</b> of a simple scientific <b>experiment</b>.</p> <p>J3. <b>Using a checklist of criteria</b> for a fair test, student can <b>determine if a given scientific test is fair</b>.</p> <p>J4. Student can <b>identify a need requiring a new invention</b>.</p> <p>J5. Student can <b>list factors</b> such as time, place, or experimenter <b>that can lead to differing data</b>.</p> <p>J6. <b>Given</b> a set of <b>data</b>, student can <b>list three facts</b> related to the data.</p>	<p>Portfolio contains evidence that:</p> <p>J1. <b>Given objects</b>, student can <b>make an observation</b> that <b>can be measured</b> (time, length, area, perimeter, weight, temperature, mass, capacity, volume) <b>using two different standard tools</b>, and <b>identify</b> the appropriate <b>tools</b>.</p> <p>J2. Student can <b>follow given steps</b> of a simple scientific <b>experiment</b> and <b>collect</b> related <b>data</b>.</p> <p>J3. <b>Given a scientific test</b>, student can <b>determine if it is a fair test</b>, and <b>record</b> observed <b>patterns</b>.</p> <p>J4. Student can <b>identify a need requiring</b> a new <b>invention</b> and <b>describe/demonstrate the attributes</b> of an invention that would meet the need.</p> <p>J5. <b>Given a specific experiment</b>, student can <b>identify how a variation(s) in one factor</b> such as time, place, or experimenter <b>might lead to differing data</b>.</p> <p>J6. <b>Given</b> a set of <b>data</b>, student can <b>list different conclusions</b> that can be derived from it.</p>	<p>Portfolio contains evidence that:</p> <p>J1. Student can <b>make accurate observations using two</b> appropriate <b>standard tools and two different units of measure</b> (e.g., measurement to the nearest mm, <b>ounce</b>).</p> <p>J2. Student can <b>conduct experiments</b>, and <b>analyze</b> related <b>data collected</b>.</p> <p>J3. <b>Given a scientific test</b>, student can <b>determine if it is a fair test</b> and demonstrate an ability to <b>interpret data to make further predictions</b>.</p> <p>J4. Student can <b>design an invention</b> to meet a need.</p> <p>J5. <b>Given a specific experiment</b>, student can <b>identify how a variation in each of two factors</b> such as time, place, or experimenter <b>might lead to differing data</b>.</p> <p>J6. <b>Given</b> a set of <b>data</b>, student can <b>describe/demonstrate</b> how different <b>conclusions</b> can be derived from the same data, using <b>one example</b>.</p>	<p>Portfolio contains evidence that:</p> <p>J1. Student can <b>make accurate observations using three</b> appropriate <b>standard tools</b> and units of measure (e.g., measurement to the nearest mm, <b>ounce, second</b>).</p> <p>J2. Student can <b>conduct scientific investigations</b> by making <b>observations, collecting and analyzing data, and doing experiments</b>.</p> <p>J3. Student can <b>use the results of an experiment</b> in a purposeful way: <b>design fair tests, make predictions based on observed patterns, and interpret data to make further predictions</b>.</p> <p>J4. Student can <b>design and build an invention, to meet a need. purpose</b>.</p> <p>J5. Student can <b>describe/demonstrate how differences</b> in time, place, or experimenter <b>can lead to different data</b>, using <b>two different examples</b>.</p> <p>J6. Student can <b>describe/demonstrate how different conclusions can be derived from the same data</b>, using <b>two different examples</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>J1. Make accurate observations using appropriate tools and units of measure.</b></p> <p><b>J2. Conduct scientific investigations: make observations, collect and analyze data, and do experiments.</b></p> <p><b>J3. Use results in a purposeful way: design fair tests, make predictions based on observed patterns, and interpret data to make further predictions.</b></p> <p><b>J4. Design and build an invention.</b></p> <p><b>J5. Explain how differences in time, place, or experimenter can lead to different data.</b></p> <p><b>J6. Explain how different conclusions can be derived from the same data.</b></p>

*Students will learn to formulate and justify ideas and to make informed decisions.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>K1. Student can, <b>given two points of view</b> on a particular situation, <b>identify the one with which</b> he/she agrees.</p> <p>K2. Student can, <b>given two choices</b>, <b>identify one that supports</b> his/her <b>point of view</b>.</p> <p>K3. Student can <b>identify an object based on one characteristic</b>.</p> <p>K4. When <b>provided</b> with a relevant piece of <b>information</b>, student <b>contributes it to the group</b> at an appropriate time.</p> <p>K5. <b>Given a choice of two</b> scenarios student can <b>identify</b> the one that is <b>logical</b> (<i>makes sense</i>).</p> <p>K6. Student can <b>copy a pattern with two or more components</b>.</p>	<p>Portfolio contains evidence that:</p> <p>K1. Student can <b>identify why</b> he/she <b>agrees with</b> a specific <b>point of view</b>.</p> <p>K2. Student can <b>identify two</b> important <b>pieces of information in</b> a simple <b>argument</b>.</p> <p>K3. Student can, when <b>shown an object</b>, <b>draw or otherwise describe two</b> of its <b>characteristics</b>.</p> <p>K4. <b>Given a topic for a brainstorming activity and an array of choices of information</b> to use, student can <b>identify information</b> that would be <b>useful</b> for the activity.</p> <p>K5. Student can <b>use one form of simple logic</b> (ex. object permanence - object is still present even if it is covered).</p> <p>K6. Student can <b>recognize, copy, and extend a pattern with two or more components</b>.</p>	<p>Portfolio contains evidence that:</p> <p>K1. Student can <b>identify facts that support</b> a <b>given point of view</b>.</p> <p>K2. Student can <b>describe</b> what makes <b>information important or unimportant</b> in a simple <b>argument</b>.</p> <p>K3. Student can accurately <b>describe three components of</b> a <b>given environment, person, object, etc.</b></p> <p>K4. <b>Given a brainstorming topic</b>, student can <b>generate a relevant piece of information</b> to contribute.</p> <p>K5. Student can <b>use two</b> forms of simple logic.</p> <p>K6. <b>Given two choices</b>, student can <b>make a prediction based on a pattern</b> they have observed.</p>	<p>Portfolio contains evidence that:</p> <p>K1. Student can <b>examine</b> (compare and contrast) the <b>strengths and weaknesses of a simple argument</b>.</p> <p>K2. Student can <b>list important and unimportant information</b> in simple <b>arguments</b>.</p> <p>K3. Student can <b>make four accurate observations</b>.</p> <p>K4. Student <b>participates in brainstorming</b> activities by <b>contributing relevant pieces of information</b>.</p> <p>K5. Student <b>uses three forms of simple logic</b>.</p> <p>K6. Student can <b>discover relationships and patterns</b> (ex., describe, extend, create, draw conclusions from).</p>	<p><b>Students will be able to:</b></p> <p><b>K1. Examine strengths and weaknesses of simple arguments.</b></p> <p><b>K2. Distinguish between important and unimportant information in simple arguments.</b></p> <p><b>K3. Make observations.</b></p> <p><b>K4. Participate in brainstorming activities.</b></p> <p><b>K5. Use various forms of simple logic.</b></p> <p><b>K6. Discover relationships and patterns.</b></p>

# Science & Technology Content Standard K - Scientific Reasoning

# PAAP Rubric Level 2

*Students will learn to formulate and justify ideas and to make informed decisions.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>K1. From a <b>given list</b>, student can <b>pick out a reasonable explanation</b> of observed phenomena.</p> <p>K2. Student can <b>describe/demonstrate</b> his/her <b>feelings</b> related to given topics.</p> <p>K3. <b>Given a list of statements</b>, student can <b>identify those that are conclusions based on an observation</b>.</p> <p>K4. <b>Given a claim and three types of evidence</b>, student can <b>identify the evidence needed to support the claim</b>.</p> <p>K5. <b>Given an idea</b>, student can <b>choose good reasons to support</b> that idea from <b>given examples</b>.</p> <p>K6. Student can <b>brainstorm ideas</b> appropriate to a particular <b>topic</b>.</p>	<p>Portfolio contains evidence that:</p> <p>K1. Student can <b>provide a logical alternative explanation</b> for an observed phenomenon.</p> <p>K2. Student can <b>separate feelings from reasoning</b> as related to given topics.</p> <p>K3. Student can <b>draw reasonable conclusions based on happenings</b> in his/her daily life.</p> <p>K4. <b>Given a claim</b>, student can <b>describe/demonstrate</b> the <b>type of evidence</b> needed to support the claim.</p> <p>K5. Student can <b>generate one good reason</b> that would <b>make a specific idea more believable</b>.</p> <p>K6. Student can practice and <b>apply brainstorming</b>, and appropriately <b>use one given intuitive thinking or logic based strategy</b>.</p>	<p>Portfolio contains evidence that:</p> <p>K1. Student can <b>provide two logical alternative explanations</b> for observed phenomena.</p> <p>K2. Student can <b>describe/demonstrate</b> his/her <b>feelings</b> relative to a specific topic, and <b>apply reasoning to make a decision</b> related to the topic.</p> <p>K3. Student can <b>draw accurate conclusions based on an observation</b>.</p> <p>K4. Student can <b>use one type of evidence to support a claim</b>.</p> <p>K5. Student can <b>generate give two</b> good reasons that would <b>make a specific idea more believable</b>.</p> <p>K6. Student can practice and <b>apply brainstorming</b>, and either <b>intuitive thinking or simple logic</b>.</p>	<p>Portfolio contains evidence that:</p> <p>K1. Student can <b>provide logical alternative explanations for two different sets</b> of observed phenomena.</p> <p>K2. Student can <b>describe/demonstrate how feelings can distort reasoning</b>.</p> <p>K3. Student can <b>draw accurate conclusions</b> about <b>two observations</b>.</p> <p>K4. Student can <b>use two types of evidence</b> (e.g., logical, quantitative) to <b>support a claim</b>.</p> <p>K5. Student can <b>describe/demonstrate understanding</b> that <b>ideas are more believable when supported</b> by good reasons.</p> <p>K6. Student can practice and <b>apply brainstorming, intuitive thinking, and simple logic</b>.</p>	<p><b>Students will be able to:</b></p> <p><b>K1. Give alternative explanations for observed phenomena.</b></p> <p><b>K2. Describe how feelings can distort reasoning.</b></p> <p><b>K3. Draw conclusions about observations.</b></p> <p><b>K4. Use various types of evidence (e.g., logical, quantitative) to support a claim.</b></p> <p><b>K5. Demonstrate an understanding that ideas are more believable when supported by good reasons.</b></p> <p><b>K6. Practice and apply simple logic, intuitive thinking, and brainstorming.</b></p>



*Students will communicate effectively in the application of science and technology.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>L1. <b>Given a set of two to four objects</b>, the student can <b>choose the one</b> that <b>has a specific observable characteristic</b> (ex., "Show me the one that is red.").</p> <p>L2. Student can <b>respond</b> appropriately <b>to a single step instruction</b> given through symbols, words, or gestures.</p> <p>L3. Student can, <b>given a choice of two questions</b>, <b>identify the one appropriate</b> to a given situation.</p> <p>L4. Student can, when confronted with a <b>real-life problem</b>, take an <b>appropriate step towards a solution</b> (ex., turning on lights in a dark room).</p> <p>L5. Student can <b>collect</b> data for a given arrangement (ex., weather chart).</p> <p>L6. <b>Given a set</b> of pictures, objects, and/or symbols, student can <b>choose those related to a specific scientific or technological idea</b> (ex., day's weather, day/night cycle).</p>	<p>Portfolio contains evidence that:</p> <p>L1. <b>Given a set of five or more objects</b>, the student can <b>identify all</b> the ones <b>that have the same specific observable characteristic</b> (ex., "Show me all the objects that are red.").</p> <p>L2. Student can <b>respond</b> appropriately <b>to multiple step instructions</b> given through symbols, words, or gestures.</p> <p>L3. Student can, <b>given four questions</b>, <b>match them to given situations</b> to which they are appropriate.</p> <p>L4. Student can use pictorial, verbal, and/or written <b>methods</b> to <b>describe/demonstrate an appropriate step to move towards a solution</b> to a problem.</p> <p>L5. Student can <b>collect and arrange</b> data.</p> <p>L6. <b>Given a group</b> of pictures, objects, and/or symbols, student can <b>choose those related to specific scientific and technological ideas</b>.</p>	<p>Portfolio contains evidence that:</p> <p>L1. Student can <b>describe/demonstrate</b> and <b>compare</b> items <b>on the basis of one attribute</b>.</p> <p>L2. Student can <b>respond</b> appropriately <b>to multiple step instructions</b> given through symbols, words, or gestures, <b>and</b>, using words or symbols, <b>write/demonstrate a one-step direction</b> to be followed by others.</p> <p>L3. Student can <b>generate one or more clarifying questions</b> appropriate to a given situation.</p> <p>L4. Student can use verbal, pictorial, and/or written <b>methods</b> to <b>describe/demonstrate the steps</b> in the process appropriate <b>to solve a specific problem</b>.</p> <p>L5. Student can <b>solve problems</b> by collecting, arranging, and interpreting data.</p> <p>L6. Student can use objects and/or pictures to <b>represent one scientific or one technological idea</b> (ex., life cycle, renewable and non-renewable resources).</p>	<p>Portfolio contains evidence that:</p> <p>L1. Student can <b>describe/demonstrate and compare</b> items on the <b>basis of two attributes</b>.</p> <p>L2. Student can <b>respond</b> appropriately <b>to multiple step instructions</b> given through symbols, words, or gestures, <b>and</b>, using words or symbols, <b>write/demonstrate a two-step direction</b> to be followed by others.</p> <p>L3. Student can <b>generate clarifying questions</b> appropriate to <b>two given situations</b>.</p> <p>L4. Student can use verbal, pictorial, and/or written <b>methods</b> to <b>describe/demonstrate the steps</b> in the processes needed to <b>solve two specific problems</b>.</p> <p>L5. Student can <b>make one or more simple graphs</b> (ex., bar graph, pie chart) <b>and interpret data</b> placed on the graph.</p> <p>L6. Student can use objects and/or pictures to <b>represent two or more scientific and two or more technological ideas</b> (ex., life cycle, renewable and non-renewable resources).</p>	<p><b>Students will be able to:</b></p> <p><b>L1. Describe and compare things in terms of number, shape, texture, size, weight, color, and behavior.</b></p> <p><b>L2. Read and write instructions to be followed or instructions which explain procedures.</b></p> <p><b>L3. Ask clarifying questions.</b></p> <p><b>L4. Explain problem-solving processes using verbal, pictorial, and written methods.</b></p> <p><b>L5. Make and read simple graphs.</b></p> <p><b>L6. Use objects and pictures to represent scientific and technological ideas.</b></p>

*Students will communicate effectively in the application of science and technology.*

Performance Level 1	Performance Level 2	Performance Level 3	Performance Level 4	Learning Results Performance Indicators
<p>Portfolio contains evidence that:</p> <p>L1. Student can <b>list facts</b> related to experiments or activities (e.g., interviews, discussions, field work).</p> <p>L2. Student can <b>generate/ask clarifying questions</b> related to <b>two different</b> situations.</p> <p>L3. <b>Given two options</b> in a specific situation, student can <b>reflect on</b> the <b>options</b> and <b>communicate</b> his/her <b>choice</b>.</p> <p>L4. Student can <b>match</b> related pictures to a given <b>procedure or idea</b>.</p>	<p>Portfolio contains evidence that:</p> <p>L1. Student can <b>record results</b> of experiments or activities (e.g., interviews, discussions, field work).</p> <p>L2. Student can <b>generate/ask clarifying and an extending question</b> related to <b>three or more different</b> situations.</p> <p>L3. Student can <b>reflect on a topic</b> of choice using an appropriate activity (ex., discussion, journal, self-assessment, etc.).</p> <p>L4. Student can <b>select</b> appropriate sketches, physical representations, <b>or</b> manipulatives to <b>demonstrate given procedures or ideas</b>.</p>	<p>Portfolio contains evidence that:</p> <p>L1. Student can <b>record results</b> of experiments or activities (e.g., interviews, discussions, field work), <b>and communicate</b> what he/she has learned.</p> <p>L2. Student can <b>generate/ask clarifying or extending questions</b> related to <b>two specific</b> topics.</p> <p>L3. Student can <b>reflect on a science or technology related topic</b> through an appropriate activity (ex., discussion, journal, self-assessment, etc.).</p> <p>L4. Student can <b>make or use two of the following to explain</b> procedures and ideas: sketches, tables, graphs, physical representations, manipulatives.</p>	<p>Portfolio contains evidence that:</p> <p>L1. Student can <b>record results</b> of experiments or activities (e.g., interviews, discussions, field work), <b>and summarize and communicate</b> what they have learned.</p> <p>L2. Student can <b>generate/ask clarifying and extending questions</b> related to <b>three specific</b> topics.</p> <p>L3. Student can <b>reflect on topics related to science and technology using two different kinds of activities</b> (ex., discussions, journals, and self-assessment).</p> <p>L4. Student can <b>make and/or use three of the following to explain</b> procedures and ideas: sketches, tables, graphs, physical representations, manipulatives.</p>	<p><b>Students will be able to:</b></p> <p><b>L1. Record results of experiments or activities (e.g., interviews, discussions, field work) and summarize and communicate what they have learned.</b></p> <p><b>L2. Ask clarifying and extending questions.</b></p> <p><b>L3. Reflect on work in science and technology using such activities as discussions, journals, and self-assessment.</b></p> <p><b>L4. Make and/or use sketches, tables, graphs, physical representations, and manipulatives to explain procedures and ideas.</b></p>

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*Students will communicate effectively in the application of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                        | Performance Level 2                                                                                                                                                                                                                                                                                                                                    | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Learning Results<br>Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <p>Portfolio contains evidence that:</p> <p>L5. Student can <b>gather information</b> using <b>two</b> different <b>media</b>.</p> <p>L6. Student can <b>point out differences</b> between <b>information from two sources</b> on the same topic.</p> <p>L7. Student can, when <b>given a choice of role</b>, appropriately <b>carry out its functions in a group</b>.</p> | <p>Portfolio contains evidence that:</p> <p>L5. Student can <b>gather and present information</b> using <b>two</b> different <b>media</b>.</p> <p>L6. Student can <b>cite examples of bias in a single source</b>.</p> <p>L7. Student can, when repeatedly <b>assigned the same role</b>, appropriately <b>carry out its functions in a group</b>.</p> | <p>Portfolio contains evidence that:</p> <p>L5. Student can <b>gather and present information using two different media including computers</b> (e.g., spreadsheets, word processing, programming, graphics, or modeling).</p> <p>L6. Student can <b>cite examples of bias in information sources and question the validity of one source's information when compared to information from another source</b>.</p> <p>L7. Student can appropriately <b>carry out two different assigned roles</b> (e.g., reader, recorder), <b>in a group</b>.</p> | <p>Portfolio contains evidence that:</p> <p>L5. Student can <b>gather and present information using three different media including computers</b> (e.g., spreadsheets, word processing, programming, graphics, or modeling).</p> <p>L6. Student can <b>cite examples of bias in information sources and, based on a comparison of three sources, question the validity of specific information</b>.</p> <p>L7. Student can appropriately <b>carry out three or more assigned roles</b> (e.g., reader, recorder), <b>in different groups</b>.</p> | <p><b>Students will be able to:</b></p> <p><b>L5. Gather and effectively present information, using a variety of media including computers (e.g., spreadsheets, word processing, programming, graphics, modeling).</b></p> <p><b>L6. Cite examples of bias in information sources and question the validity of information from varied sources.</b></p> <p><b>L7. Function effectively in groups within various assigned roles (e.g., reader, recorder).</b></p> |

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# Science & Technology Content Standard M - Implications of Science and Technology PAAP Rubric Level 1

*Students will understand the historical, social, economic, environmental, and ethical implications of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Learning Results<br>Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>identify components of the world</b> around them (ex., sky, grass, sun).</p> <p>M2. Student can <b>match an invention to what it does.</b></p> <p>M3. Student can <b>identify</b> a commonly used <b>resource</b> in their environment (ex., food, trees).</p> <p>M4. Student can <b>participate in</b> at least <b>one</b> classroom or school <b>practice for recycling.</b></p> <p>M5. Student can appropriately <b>use an invention</b> for its intended purpose.</p> | <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>pick out</b> of given stories or legends one part that <b>attempts to explain the world.</b></p> <p>M2. <b>Given a description of two</b> purposes, the student can <b>select the inventions serving those purposes</b> from a <b>group of four</b> or more inventions.</p> <p>M3. Student can <b>identify two</b> or more commonly used <b>resources and where they come from.</b></p> <p>M4. Student can <b>identify/demonstrate two</b> practices for recycling.</p> <p>M5. Student can <b>identify two or more inventions</b> that he/she uses and the <b>need that each meets.</b></p> | <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>identify what</b> about the world a <b>story, legend or scientific explanation is trying to make understandable.</b></p> <p>M2. Student can <b>describe/demonstrate understanding</b> related to two <b>inventions, what they do, and how they work.</b></p> <p>M3. Student can <b>identify two</b> commonly used <b>resources, where they come from, and where waste products</b> resulting from their work <b>go.</b></p> <p>M4. Student can <b>describe/demonstrate three</b> practices for recycling.</p> <p>M5. Student can <b>describe/demonstrate how life would be different without two specific inventions and identify one piece of specific scientific knowledge</b> that made a difference in his/her life.</p> | <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>describe/demonstrate how stories, legends, and scientific explanations</b> are different ways in which people <b>try to make the world understandable.</b></p> <p>M2. Student can <b>describe/demonstrate two inventions, what they do, how they work, and how they have made life easier.</b></p> <p>M3. Student can <b>identify three</b> commonly used <b>resources, where they come from, and where waste products</b> resulting from their use <b>go.</b></p> <p>M4. Student can <b>describe/demonstrate three</b> practices for recycling, and <b>two practices for caring for resources.</b></p> <p>M5. Student can <b>describe/demonstrate how life would be different without two specific inventions and identify two pieces of specific scientific knowledge</b> that have made a difference in his/her life.</p> | <p><b>Students will be able to:</b></p> <p><b>M1. Describe how legends, stories, and scientific explanations are different ways in which people attempt to explain the world.</b></p> <p><b>M2. Describe at least two inventions, what they do, how they work, and how they have made life easier.</b></p> <p><b>M3. Identify commonly used resources, their sources, and where waste products go.</b></p> <p><b>M4. Demonstrate some practices for recycling and care of resources.</b></p> <p><b>M5. Explain how their lives would be different without specific inventions or scientific knowledge.</b></p> |

# Science & Technology Content Standard M - Implications of Science and Technology PAAP Rubric Level 2

*Students will understand the historical, social, economic, environmental, and ethical implications of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>identify</b> the <b>technological solutions used by two different cultures to one need or problem</b> (e.g., construction, clothing, agricultural tools and methods).</p> <p>M2. Student can <b>collect information about a specific scientist <u>or</u> inventor.</b></p> <p>M3. Student can <b>identify two or more technologies</b> (e.g., transportation, irrigation) that <b>they use</b> in their environment.</p> <p>M4. Student can <b>identify two conservation practices</b> from daily life and the reason(s) for their use.</p> | <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>draw conclusions about the technological solutions used by two different cultures to two needs or problems</b> (e.g., construction, clothing, agricultural tools and methods).</p> <p>M2. Student can <b>collect information about a specific scientist <u>and</u> a specific inventor.</b></p> <p>M3. Student can <b>give factual information related to a technology</b> (e.g., transportation, irrigation) that <b>has altered human settlement.</b></p> <p>M4. Student can <b>identify renewable and non-renewable resources</b> among a given group of resources.</p> | <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>draw conclusions about</b> how <b>three different cultures</b> have <b>found different technological solutions to deal with two similar needs or problems</b> (e.g., construction, clothing, agricultural tools and methods).</p> <p>M2. Student can <b>describe/demonstrate the role of a scientist <u>or</u> an inventor</b>, using information collected.</p> <p>M3. Student can <b>identify two technologies</b> (e.g., transportation, irrigation) that <b>have altered human settlement</b> and <b>describe/demonstrate why</b> the technologies had that effect.</p> <p>M4. Student can <b>describe/demonstrate practices for conservation</b> in daily life, <b>and describe/demonstrate two non-renewable resources.</b></p> | <p>Portfolio contains evidence that:</p> <p>M1. Student can <b>draw conclusions about</b> how <b>four cultures</b> have found <b>different technological solutions to deal with two similar needs or problems</b> (e.g., construction, clothing, agricultural tools and methods).</p> <p>M2. Student can <b>collect information and use it to describe/demonstrate the roles of scientists <u>and</u> inventors.</b></p> <p>M3. Student can <b>draw conclusions about how three technologies</b> (e.g., transportation, irrigation) have altered human settlement.</p> <p>M4. Student can <b>describe/demonstrate practices for conservation</b> in daily life, and <b>describe/demonstrate understanding that renewable and non-renewable resources have limits.</b></p> | <p><b>Students will be able to:</b></p> <p><b>M1. Explore how cultures have found different technological solutions to deal with similar needs or problems (e.g., construction, clothing, agricultural tools and methods).</b></p> <p><b>M2. Investigate and describe the role of scientists and inventors.</b></p> <p><b>M3. Explore how technology (e.g., transportation, irrigation) has altered human settlement.</b></p> <p><b>M4. Explain practices for conservation in daily life, based on recognition that renewable and non-renewable resources have limits.</b></p> |

# Science & Technology Content Standard A - Classifying Life Forms

# PAAP Rubric Level 3

*Students will understand that there are similarities within the diversity of all living things.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                    | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 3.</p> <p>Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Classifying Life Forms at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Compare systems of classifying organisms in different ways using different characteristics.</b></li> <li><b>2. Decipher the system for assigning a scientific name to every living thing.</b></li> <li><b>3. Describe some structural and behavioral adaptations that allow organisms to survive in a changing environment.</b></li> </ol> |



# Science & Technology Content Standard A - Classifying Life Forms

# PAAP Rubric Level 4

*Students will understand that there are similarities within the diversity of all living things.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                    | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard A, Classifying Life Forms, at PAAP Rubric Level 4.</p> <p>Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Classifying Life Forms at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Explain the role of DNA in resolving questions of relationship and evolutionary change.</b></li> <li><b>2. Describe similarities and differences among organisms within each level of the taxonomic system for classifying organisms (kingdom through species).</b></li> <li><b>3. Analyze the basic characteristics of living things, including their need for food, water, and gases and the ability to reproduce.</b></li> </ol> |

## Science & Technology Content Standard B - Ecology

## PAAP Rubric Level 3

*Students will understand how living things depend on one another and on non-living aspects of the environment.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Ecology at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Describe in general terms the chemical processes of photosynthesis and respiration.</b></li> <li><b>2. Analyze how the finite resources in an ecosystem limit the types and populations of organisms within it.</b></li> <li><b>3. Describe succession and other ways that ecosystems can change over time.</b></li> <li><b>4. Generate examples of the variety of ways that organisms interact (e.g., competition, predator/prey, parasitism/mutualism).</b></li> <li><b>5. Describe various mechanisms found in the natural world for transporting living and non-living matter and the results of such movements.</b></li> </ol> |

## Science & Technology Content Standard B - Ecology

## PAAP Rubric Level 4

*Students will understand how living things depend on one another and on non-living aspects of the environment.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard B, Ecology, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Ecology at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Illustrate the cycles of matter in the environment and explain their interrelationships.</b></li> <li><b>2. Compare the process of photosynthesis and respiration, and describe the factors that affect them.</b></li> <li><b>3. Analyze the factors that affect population size (e.g., reproductive and survival rates).</b></li> <li><b>4. Analyze the impact of human and other activities on the type and pace of change in ecosystems.</b></li> </ol> |

# Science & Technology Content Standard C - Cells

# PAAP Rubric Level 3

*Students will understand that cells are the basic units of life.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                              | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard C, Cells, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard C, Cells, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard C, Cells at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard C, Cells, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Cells at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Compare and contrast human organ systems with those of other species.</b></li> <li><b>2. Prepare and examine microscope slides of single-celled and multi-celled organisms.</b></li> <li><b>3. Describe the structure and function of major organs in human systems.</b></li> <li><b>4. Identify the causes and effects of diseases, explain their transmission, and identify prevention strategies.</b></li> <li><b>5. Describe how body systems work together.</b></li> </ol> |

## Science & Technology Content Standard C - Cells

## PAAP Rubric Level 4

*Students will understand that cells are the basic units of life.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                              | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard C, Cells, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard C, Cells, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard C, Cells at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard C, Cells, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Cells at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Relate the parts of a cell to their function.</b></li> <li><b>2. Illustrate how cells replicate and transmit information, including the roles of DNA and RNA.</b></li> <li><b>3. Discuss the function of the important "molecules of life" – proteins (including enzymes and hormones), carbohydrates, lipids, and nucleic acids.</b></li> <li><b>4. Explain how the human body protects itself against disease and how the body might lose that ability.</b></li> <li><b>5. Analyze and debate basic principles of genetic engineering: how it is done, its uses, and some ethical implications.</b></li> </ol> |

# Science & Technology Content Standard D - Continuity and Change

# PAAP Rubric Level 3

*Students will understand the basis for all life and that all living things change over time.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                              | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                   | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Continuity and Change at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Describe how fossils can be used by scientists to trace the history of a species.</b></li> <li><b>2. Explain how scientists use fossils to prove that life forms, climate, environment, and geologic features in a certain location are not the same now as they were in the past.</b></li> <li><b>3. Provide examples of the concept of natural and artificial selection and its role in species changes over time.</b></li> <li><b>4. Compare how sexually and asexually reproducing species transfer genetic information to offspring.</b></li> </ol> |

# Science & Technology Content Standard D - Continuity and Change

# PAAP Rubric Level 4

*Students will understand the basis for all life and that all living things change over time.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                              | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                   | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard D, Continuity and Change, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Continuity and Change at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Explain how mutations can be caused by gene mutation or chromosomal alteration and describe the possible results of such mutations on individuals or populations.</b></li> <li><b>2. Describe why the offspring of sexually reproducing species have different survival rates that those of asexually reproducing species under a variety of conditions. Describe the advantages and disadvantages of each.</b></li> <li><b>3. Explain and document the importance of relatively short-term changes (e.g., one generation) on a species' survival.</b></li> <li><b>4. Describe how genetic manipulation can cause unusually rapid changes in species.</b></li> <li><b>5. Compare and contrast fertilization, zygote formation, and embryo development in humans and other species.</b></li> <li><b>6. Analyze a theory scientists use to explain the origin of life.</b></li> <li><b>7. Explain both the evidence used to develop the geologic time scale and why an awareness of geologic time is important to an understanding of the process of change in the universe as well as on earth.</b></li> </ol> |



# Science & Technology Content Standard E - Structure of Matter

# PAAP Rubric Level 3

*Students will understand the structure of matter and the changes it can undergo.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                            | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                   | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                 | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 3.</p> <p>Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Structure of Matter at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Predict and test whether objects will float or sink based on a qualitative and quantitative understanding of the concepts of density and buoyancy.</b></li> <li><b>2. Describe the evidence that all matter consists of particles called atoms that are made up of certain smaller particles.</b></li> <li><b>3. Use the Periodic Table to group elements based on their characteristics.</b></li> <li><b>4. Describe how a substance can combine with different substances in different ways, depending on the conditions and the properties of each substance.</b></li> <li><b>5. Describe how the motion of the particles of matter determines the state of that matter (e.g., solid, liquid, gas, plasma) found in the world.</b></li> <li><b>6. Explain how the relatively small number of naturally occurring elements can result in the large variety of substances found in the world.</b></li> <li><b>7. Investigate the similarities and differences between elements, compounds, and mixtures.</b></li> <li><b>8. Demonstrate the law of conservation of matter.</b></li> </ol> |



# Science & Technology Content Standard E - Structure of Matter

# PAAP Rubric Level 4

*Students will understand the structure of matter and the changes it can undergo.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                            | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                   | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                 | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard E, Structure of Matter, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Structure of Matter at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>Trace the development of models of the atom to the present and describe how each model reflects the scientific understanding of their time.</b></li> <li><b>Analyze how matter is affected by changes in temperature, pressure, and volume.</b></li> <li><b>Describe the characteristics and behavior of acids and bases.</b></li> <li><b>Describe an application of the Law of Conservation of Matter.</b></li> <li><b>Describe how atoms are joined by chemical bonding.</b></li> <li><b>Compare the physical and chemical characteristics of elements.</b></li> <li><b>Describe nuclear reactions, including fusion, fission, and decay, their occurrences in nature, and how they can be used by humans.</b></li> </ol> |

# Science & Technology Content Standard F – The Earth

# PAAP Rubric Level 3

*Students will gain knowledge about the earth and the processes that change it.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for The Earth at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Demonstrate how the earth's tilt on its axis results in the seasons.</b></li> <li><b>2. Describe how soils are formed and why soils differ from one place to another.</b></li> <li><b>3. Explain the evidence scientists use when they give the age of the earth.</b></li> <li><b>4. Describe factors that can cause short-term and long-term changes to the earth.</b></li> <li><b>5. Classify and identify rocks and minerals based on their physical and chemical properties, their composition, and the processes which formed them.</b></li> <li><b>6. Describe the many products used by humans that are derived from materials in the earth's crust.</b></li> <li><b>7. Demonstrate factors affecting the flow of groundwater.</b></li> </ol> |

# Science & Technology Content Standard F – The Earth

# PAAP Rubric Level 4

*Students will gain knowledge about the earth and the processes that change it.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard F, The Earth, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for The Earth at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Describe how air pressure, temperature, and moisture interact to cause changes in the weather.</b></li> <li><b>2. Analyze potential effects of changes in the earth's oceans and atmosphere.</b></li> <li><b>3. Describe the impact of plate movement and erosion on the rock cycle.</b></li> <li><b>4. Describe ways that scientists measure long periods of time and determine the age of very old objects.</b></li> <li><b>5. Demonstrate how rocks and minerals are used to determine geologic history.</b></li> <li><b>6. Analyze the changes in continental position and the evidence that supports the concept of tectonic plates.</b></li> </ol> |

## Science & Technology Content Standard G – The Universe

## PAAP Rubric Level 3

*Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                            | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                          | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for The Universe at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Compare past and present knowledge about characteristics of stars (e.g., composition, location, life-cycles) and explain how people have learned about them.</b></li> <li><b>2. Describe the concept of galaxies, including size and number of stars.</b></li> <li><b>3. Compare and contrast distances and the time required to travel those distances on earth, in the solar system, in the galaxy, and between galaxies.</b></li> <li><b>4. Describe scientists' exploration of space and the objects they have found (e.g., comets, asteroids, pulsars).</b></li> <li><b>5. Describe the motions of moons, planets, stars, solar systems, and galaxies.</b></li> </ol> |

## Science & Technology Content Standard G – The Universe

## PAAP Rubric Level 4

*Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                     | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                            | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                          | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard G, The Universe, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for The Universe at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Describe how scientists gather data about the universe.</b></li> <li><b>2. Research current explanations for phenomena such as black holes and quasars.</b></li> <li><b>3. Explain how astronomers measure interstellar distances.</b></li> </ol> |

# Science & Technology Content Standard H- Energy

# PAAP Rubric Level 3

*Students will understand concepts of energy.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                    | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Energy at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>Analyze the benefits and drawbacks of energy conversions (e.g., in electricity generation).</b></li> <li><b>Demonstrate that energy cannot be created or destroyed but only changed from one form to another.</b></li> <li><b>Compare and contrast the ways energy travels (e.g., waves, conduction, convection, radiation).</b></li> <li><b>Describe the characteristics of static and current electricity.</b></li> <li><b>Categorize energy sources as renewable or non-renewable and compare how these sources are used by humans.</b></li> <li><b>Describe how energy put in or taken out of a system can cause changes in the motion of particles in matter.</b></li> </ol> |

# Science & Technology Content Standard H- Energy

# PAAP Rubric Level 4

*Students will understand concepts of energy.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                    | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard H, Energy, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Energy at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>Analyze the evidence that leads scientists to conclude that light behaves somewhat like a wave and somewhat like a particle.</b></li> <li><b>Examine and describe how light is reflected and refracted (deflected) by mirrors and lenses.</b></li> <li><b>Explain or demonstrate how sound waves travel.</b></li> <li><b>Analyze the relationship between the kinetic and potential energy of a falling object.</b></li> <li><b>Use mathematics to describe the work and power in a system.</b></li> <li><b>Describe the relationship between matter and energy and how matter releases energy through the processes of nuclear fission and fusion.</b></li> <li><b>Use mathematics to describe and predict electrical and magnetic activity (e.g., current, resistance, voltage).</b></li> <li><b>Compare and contrast how conductors, semiconductors, and superconductors work and describe their present and potential uses.</b></li> <li><b>Demonstrate an understanding that energy can be found in chemical bonds and can be used when it is released from their bonds.</b></li> </ol> |



# Science & Technology Content Standard I - Motion

# PAAP Rubric Level 3

*Students will understand the motion of objects and how forces can change that motion.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                    | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                  |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 3. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Motion at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Describe the motion of objects using knowledge of Newton's Laws.</b></li> <li><b>2. Use mathematics to describe the motion of objects (e.g., speed, distance, time, acceleration).</b></li> <li><b>3. Describe and quantify the ways machines can provide mechanical advantages in producing motion.</b></li> </ol> |



# Science & Technology Content Standard I - Motion

# PAAP Rubric Level 4

*Students will understand the motion of objects and how forces can change that motion.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                      | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                    | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge and skills identified in the targeted Performance Indicator for Content Standard I, Motion, at PAAP Rubric Level 4. Understanding may be demonstrated by using the concept(s) to describe, predict, or explain; representing the concept in multiple ways; or by explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Motion at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Use mathematics to describe the law of conservation of momentum.</b></li> <li><b>2. Explain some current theories of gravitational force.</b></li> <li><b>3. Use Newton's Laws to qualitatively and quantitatively describe the motion of objects.</b></li> <li><b>4. Describe how forces affect fluids (e.g., air and water).</b></li> <li><b>5. Explain the relationship between temperature, heat, and molecular motion.</b></li> <li><b>6. Describe how forces within and between atoms affect their behavior and the properties of matter.</b></li> </ol> |

# Science & Technology Content Standard J - Inquiry and Problem Solving

# PAAP Rubric Level 3

*Students will apply inquiry and problem-solving approaches in science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                           | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 3.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 3. The PAAP contains evidence of accurate, appropriate, observation, investigation (asking questions and proposing strategies), data collection and analysis, drawing conclusions, or using results.</p> <p>The PAAP contains evidence that the student has met the standards for Inquiry and Problem Solving at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Make accurate observations using appropriate tools and units of measure.</b></li> <li><b>2. Design and conduct scientific investigations which include controlled experiments and systematic observations.</b></li> <li><b>3. Verify and evaluate scientific investigations and use the results in a purposeful way.</b></li> <li><b>4. Compare and contrast the processes of scientific inquiry and the technological method.</b></li> <li><b>5. Explain how personal bias can affect observations.</b></li> <li><b>6. Design, construct, and test a device (invention) that solves a special problem.</b></li> </ol> |

# Science & Technology Content Standard J - Inquiry and Problem Solving

# PAAP Rubric Level 4

*Students will apply inquiry and problem-solving approaches in science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                  | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                           | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 4.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the concepts, skills, and knowledge identified in the targeted Performance Indicator for Content Standard J, Inquiry and Problem Solving, at PAAP Rubric Level 4. The PAAP contains evidence of accurate, appropriate observation, investigation (asking questions and proposing strategies), data collection and analysis, drawing conclusions, or using results.</p> <p>The PAAP contains evidence that the student has met the standards for Inquiry and Problem Solving at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Make accurate observations using appropriate tools and units of measure.</b></li> <li><b>2. Verify, evaluate, and use results in a purposeful way. This includes analyzing and interpreting data, making predictions based on observed patterns, testing solutions against the original problem conditions, and formulating additional questions.</b></li> <li><b>3. Demonstrate the ability to use scientific inquiry and technological method with short term and long term investigations, recognizing that there is more than one way to solve a problem. Demonstrate knowledge of when to try different strategies.</b></li> <li><b>4. Design and construct a device to perform a specific function, then redesign for improvement (e.g., performance, cost).</b></li> </ol> |

# Science & Technology Content Standard K - Scientific Reasoning

# PAAP Rubric Level 3

*Students will learn to formulate and justify ideas and to make informed decisions.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <p>Evidence indicates that the student is in the initial stages of development in the application of Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 3. Student work includes little or no explanation to support conclusions or findings.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the application of Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 3. Student work includes limited attempts at an explanation(s) to support conclusions or findings.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to apply Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 3. Student work includes some explanations to support conclusions or findings.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately apply Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 3. The PAAP contains evidence of explanations that provide sufficient justification to support conclusions or findings, including a variety of evidence.</p> <p>The PAAP contains evidence that the student has met the standards for Scientific Reasoning at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Examine the ways people form generalizations.</b></li> <li><b>2. Identify exceptions to proposed generalizations.</b></li> <li><b>3. Identify basic informal fallacies in arguments.</b></li> <li><b>4. Analyze means of slanting information.</b></li> <li><b>5. Identify stereotypes.</b></li> <li><b>6. Support reasoning by using a variety of evidence.</b></li> <li><b>7. Show that proving a hypothesis false is easier than proving it true, and explain why.</b></li> <li><b>8. Construct logical arguments.</b></li> <li><b>9. Apply analogous reasoning.</b></li> </ol> |

# Science & Technology Content Standard K - Scientific Reasoning

# PAAP Rubric Level 4

*Students will learn to formulate and justify ideas and to make informed decisions.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
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| <p>Evidence indicates that the student is in the initial stages of development in the application of Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 4. Student work includes little or no explanation to support conclusions or findings.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the application of Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 4. Student work includes limited attempts at an explanation(s) to support conclusions or findings.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to apply Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 4. Student work includes some explanations to support conclusions or findings.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately apply Scientific Reasoning as identified in the targeted Performance Indicator for Content Standard K at PAAP Rubric Level 4. The PAAP contains evidence of explanations that provide sufficient justification to support conclusions or findings, including a variety of evidence.</p> <p>The PAAP contains evidence that the student has met the standards for Scientific Reasoning at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Judge the accuracy of alternative explanations by identifying the evidence necessary to support them.</b></li> <li><b>2. Explain why agreement among people does not make an argument valid.</b></li> <li><b>3. Develop generalizations based on observations.</b></li> <li><b>4. Determine when there is a need to revise studies in order to improve their validity through better sampling, controls or data analysis techniques.</b></li> <li><b>5. Produce inductive and deductive arguments to support conjecture.</b></li> <li><b>6. Analyze situations where more than one logical conclusion can be drawn.</b></li> </ol> |

# Science & Technology Content Standard L - Communication

# PAAP Rubric Level 3

*Students will communicate effectively in the application of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <p>Evidence indicates that the student is in the initial stages of development in the use of Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 3. Student work includes little or no scientific vocabulary, symbols, or visual representation, and few descriptions of procedures and conclusions.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 3. Student work includes attempts to use scientific vocabulary, symbols, or visual representation and/or provides some descriptions of procedures and conclusions.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 3. Student work includes some scientific vocabulary, symbols, or visual representation and/or provides some descriptions of procedures and conclusions.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 3. The PAAP contains evidence of the use of accurate, appropriate scientific vocabulary, symbols or visual representation, and provides a complete description of procedures and conclusions.</p> <p>The PAAP contains evidence that the student has met the standards for Communication at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Discuss scientific and technological ideas and make conjectures and convincing arguments.</b></li> <li><b>2. Ask clarifying and extending questions.</b></li> <li><b>3. Reflect on work in science and technology using such activities as discussions, journals, and self-assessment.</b></li> <li><b>4. Make and/or use sketches, tables, graphs, physical representations, and manipulatives to explain procedures and ideas.</b></li> <li><b>5. Gather and effectively present information, using a variety of media including computers (e.g., spreadsheets, word processing, programming, graphics, modeling).</b></li> <li><b>6. Cite examples of bias in information sources and question the validity of information from varied sources.</b></li> <li><b>7. Function effectively in groups within various assigned roles (e.g., reader, recorder).</b></li> </ol> |



# Science & Technology Content Standard L - Communication

# PAAP Rubric Level 4

*Students will communicate effectively in the application of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p>Evidence indicates that the student is in the initial stages of development in the use of Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 4. Student work includes little or no scientific vocabulary, symbols, or visual representation, and few descriptions of procedures and conclusions.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 4. Student work includes attempts to use scientific vocabulary, symbols, or visual representation and/or provides some descriptions of procedures and conclusions.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 4. Student work includes some scientific vocabulary, symbols, or visual representation and/or provides some descriptions of procedures and conclusions.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use Communication as identified in the targeted Performance Indicator for Content Standard L at PAAP Rubric Level 4. The PAAP contains evidence of the use of accurate, appropriate scientific vocabulary, symbols or visual representation, and provides a complete description of procedures and conclusions.</p> <p>The PAAP contains evidence that the student has met the standards for Communication at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>Analyze research or other literature for accuracy in the design and findings of experiments.</b></li> <li><b>Use journals and self-assessment to describe and analyze scientific and technological experiences and to reflect on problem-solving processes.</b></li> <li><b>Make and use appropriate symbols, pictures, diagrams, scale drawings, and models to represent and simplify real-life situations and to solve problems.</b></li> <li><b>Employ graphs, tables, and maps in making arguments and drawing conclusions.</b></li> <li><b>Critique models, stating how they do and do not effectively represent the real phenomenon.</b></li> <li><b>Evaluate the communication capabilities of new kinds of media (e.g., cameras with computer disks instead of film).</b></li> <li><b>Use computers to organize data, generate models, and do research for problem solving.</b></li> <li><b>Engage in a debate, on a scientific issue, where both points of view are based on the same set of information.</b></li> </ol> |

## Science & Technology Content Standard M -Implications for Science and Technology PAAP Rubric Level 3

*Students will understand the historical, social, economic, environmental, and ethical implications of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 3. Student work includes little or no use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 3. Student work includes limited use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 3. Student work includes some use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 3. Student work includes the use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Implications for Science and Technology at this Rubric Level and is ready to transition to the next Rubric Level for this Content Standard.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Research and evaluate the social and environmental impacts of scientific and technological developments.</b></li> <li><b>2. Describe the historical and cultural conditions at the time of an invention or discovery, and analyze the societal impacts of that invention.</b></li> <li><b>3. Discuss the ethical issues surrounding a specific scientific or technological development.</b></li> <li><b>4. Describe an individual's biological and other impacts on an environmental system.</b></li> <li><b>5. Identify factors that have caused some countries to become leaders in science and technology.</b></li> <li><b>6. Give examples of actions which may have expected or unexpected consequences that may be positive, negative, or both.</b></li> <li><b>7. Explain the connections between industry, natural resources, population, and economic development.</b></li> <li><b>8. Recognize scientific and technological contributions of diverse people including women, different ethnic groups, races, and physically disabled.</b></li> </ol> |



## Science & Technology Content Standard M -Implications for Science and Technology PAAP Rubric Level 4

*Students will understand the historical, social, economic, environmental, and ethical implications of science and technology.*

| Performance Level 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Performance Level 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Performance Level 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Performance Level 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Learning Results Performance Indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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| <p>Evidence indicates that the student is in the initial stages of development in understanding the content knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 4. Student work includes little or no use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence of limited progress toward the development of rudimentary components of the concept, skills, and knowledge related to this Content Standard.</p> | <p>Evidence indicates that the student has developed basic abilities in the use of the knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 4. Student work includes limited use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence that there are some misconceptions, inconsistencies, and/or vague understandings related to this Content Standard.</p> | <p>Evidence indicates that the student has partially developed the ability to use the knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 4. Student work includes some use of the concept to describe, predict or explain; represent the concept in many ways; explain the concept to someone else.</p> <p>The PAAP contains evidence that the student is progressing toward, but still has some gaps in knowledge or skills and/or inconsistently applies strategies related to this Content Standard.</p> | <p>Evidence indicates that the student has the ability to consistently and accurately use the knowledge identified in the targeted Performance Indicator for Content Standard M, Implications for Science and Technology, at PAAP Rubric Level 4. Student work includes the use of the concept to describe, predict or explain; representing the concept in many ways; explaining the concept to someone else.</p> <p>The PAAP contains evidence that the student has met the standards for Implications for Science and Technology at this Rubric Level.</p> | <p><i>Students will be able to:</i></p> <ol style="list-style-type: none"> <li><b>1. Examine the impact of political decisions on science and technology.</b></li> <li><b>2. Demonstrate the importance of resource management, controlling environmental impacts, and maintaining natural ecosystems.</b></li> <li><b>3. Evaluate the ethical use or introduction of new scientific or technological developments.</b></li> <li><b>4. Analyze the impacts of various scientific and technological developments.</b></li> <li><b>5. Examine the historical relationships between prevailing cultural beliefs and breakthroughs in science and technology.</b></li> <li><b>6. Research issues that illustrate the effects of technological imbalances and suggest some solutions.</b></li> </ol> |

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